WHAT IS CLAIMED:

1. A method for defibrillating a heart in fibrillation, comprising:

detecting fibrillation of the heart; and

applying a defibrillation stimulus to a fastest activating region of the fibrillating heart.

2. A method according to Claim 1 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

3. A method according to Claim 1 wherein a first wavefront propagates along a closed pathway on the fibrillating heart, wherein the first wavefront generates at least a second wavefront that propagates on the fibrillating heart outside the fastest activating region.

4. A method according to Claim 1 wherein the fastest region comprises a closed pathway on the fibrillating heart.

5. A method according to Claim 4 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

6. A method according to Claim 5 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

7. A method according to Claim 1:

wherein the fibrillation comprises atrial fibrillation; and

wherein the fastest activating region comprises at least one of adjacent to pulmonary veins of the fibrillating heart and between the pulmonary veins and a left atrial appendage of the fibrillating heart.

8. A method according to Claim 1:

wherein the fibrillation comprises ventricular fibrillation; and

wherein the fastest activating region comprises a base of a left ventricle of the fibrillating heart.

9. A method according to Claim 1:

wherein the fibrillation comprises ventricular fibrillation; and

wherein the fastest activating region comprises a septum of the fibrillating heart.

10. A method according to Claim 1 wherein applying comprises applying a first defibrillation stimulus at least one of before, during, or after a second defibrillation stimulus that is greater than the first defibrillation stimulus.

11. A method according to Claim 10 wherein at least one of the first and second defibrillation stimuli is applied using at least a pair of electrodes, wherein the pair of electrodes is located one of:

inside the fastest activating region;

outside the fastest activating region; and

a first electrode of the pair of electrodes is inside the fastest activating region and a second electrode of the pair of electrodes is outside the fastest activating region.

12. A method according to Claim 1 wherein the defibrillation stimulus is applied using a pair of electrodes, wherein the pair of electrodes is located one of:

inside the fastest activating region;

outside the fastest activating region; and

a first electrode of the pair of electrodes is inside the fastest activating region and a second electrode of the pair of electrodes is outside the fastest activating region.

13. A method according to Claim 1 further comprising:

applying at least one pacing stimulus to the fastest activating region simultaneously with the defibrillation stimulus.

14. A method according to Claim 1 further comprising:

applying at least one pacing stimulus to the fastest activating region immediately before or after the defibrillation stimulus.

15. A method according to Claim 1 further comprising:

applying at least one first pacing stimulus at the fastest activating region at least one of before, simultaneous with, or after the defibrillation stimulus; and

applying at least one second pacing stimulus to the fibrillating heart at a location spaced-apart from the fastest activating region.

16. A method according to Claim 16 wherein the at least one second pacing stimulus is applied using at least one line electrode.

17. A method according to Claim 1 wherein the fastest activating region comprises the septum.

18. A method according to Claim 1 wherein a location of the fastest activating region is determined by:

determining a monophasic activation potential (MAP) reading associated with the fibrillating heart.

19. A method for reducing an occurrence of fibrillation of a heart, comprising:

detecting a premature contraction of the heart for a plurality of heart beats characterized by nonsustained tachycardia; and

applying an electric stimulus to a region of the heart that is likely to contain a fastest activating region.

20. A method according to Claim 19 wherein the electric stimulus comprises one of a defibrillation stimulus and a pacing stimulus.

21. A method according to Claim 19 wherein a location of the fastest activating region is determined by:

inducing fibrillation of the heart; and

determining at least one of a monophasic activation potential (MAP) reading associated with the fibrillating heart, a refractory period associated with the heart

using premature stimulation, and a power spectrum analysis to provide a spectrum with a peak power at a highest frequency.

22. A method according to Claim 19 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

23. A method according to Claim 19 wherein a first wavefront propagates along a closed pathway on the fibrillating heart, wherein the first wavefront generates at least a second wavefront that propagates on the fibrillating heart outside the fastest activating region.

24. A method according to Claim 19 wherein the reentrant region comprises a closed pathway on the fibrillating heart.

25. A method according to Claim 24 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

26. A method according to Claim 25 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

27. A method for reducing an occurrence of fibrillation of a heart, comprising:

during heart activity characterized by at least one of normal heartbeat activity, premature heartbeat activity, or nonsustained tachycardia activity, applying an electrical stimulus to a region of the heart containing a fastest activating region.

28. A method according to Claim 27 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

29. A method according to Claim 27 wherein a first wavefront propagates along a closed pathway on the heart, wherein the first wavefront generates at least a second wavefront that propagates on the heart outside the fastest activating region.

30. A method according to Claim 27 wherein the reentrant region comprises a closed pathway on the heart.

31. A method according to Claim 28 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

32. A method according to Claim 29 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

33. A method according to Claim 27 wherein a location of the fastest activating region is determined by:

determining a refractory period associated with the heart using premature stimulation.

34. A method according to Claim 28 wherein a location of the fastest activating region is determined by:

determining an activation recovery interval measurement associated with the heart.

35. A method according to Claim 27 wherein a location of the fastest activating region is determined by:

determining a Monophasic activation potential (MAP) reading of the heart.

36. A method according to Claim 27 wherein a location of the fastest activating region is determined by:

inducing fibrillation of the heart; and

determining at least one of a monophasic activation potential (MAP) reading associated with the fibrillating heart, a refractory period associated with the heart

using premature stimulation, and a power spectrum analysis to provide a spectrum with a peak power at a highest frequency.

37. A system for defibrillating a heart in fibrillation, comprising:

means for detecting fibrillation of the heart; and

means for applying a defibrillation stimulus to a fastest activating region of the fibrillating heart.

38. A system according to Claim 37 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

39. A system according to Claim 37 wherein a first wavefront propagates along a closed pathway on the fibrillating heart, wherein the first wavefront generates at least a second wavefront that propagates on the fibrillating heart outside the fastest activating region.

40. A system according to Claim 37 wherein the fastest region comprises a closed pathway on the fibrillating heart.

41. A system according to Claim 38 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

42. A system according to Claim 41 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

43. A system according to Claim 37:

wherein the fibrillation comprises atrial fibrillation; and

wherein the fastest activating region comprises at least one of adjacent to pulmonary veins of the fibrillating heart and between the pulmonary veins and a left atrial appendage of the fibrillating heart.

44. A system according to Claim 37:

wherein the fibrillation comprises ventricular fibrillation; and

wherein the fastest activating region comprises a base of a left ventricle of the fibrillating heart.

45. A system according to Claim 37:

wherein the fibrillation comprises ventricular fibrillation; and

wherein the fastest activating region comprises a septum of the fibrillating heart.

46. A system according to Claim 37 wherein the means for applying comprises means for applying a first defibrillation stimulus at least one of before, during, or after a second defibrillation stimulus that is greater than the first defibrillation stimulus.

47. A system according to Claim 46 wherein at least one of the first and second defibrillation stimuli is applied using at least a pair of electrodes, wherein the pair of electrodes is located one of:

inside the fastest activating region;

outside the fastest activating region; and

a first electrode of the pair of electrodes is inside the fastest activating region and a second electrode of the pair of electrodes is outside the fastest activating region.

48. A method according to Claim 37 wherein the defibrillation stimulus is applied using a pair of electrodes, wherein the pair of electrodes is located one of:

inside the fastest activating region;

outside the fastest activating region; and

a first electrode of the pair of electrodes is inside the fastest activating region and a second electrode of the pair of electrodes is outside the fastest activating region.

49. A system according to Claim 37 further comprising:

means for applying at least one pacing stimulus to the fastest activating region simultaneously with the defibrillation stimulus.

50. A system according to Claim 37 further comprising:

means for applying at least one pacing stimulus to the fastest activating region immediately before or after the defibrillation stimulus.

51. A system according to Claim 37 further comprising:

means for applying at least one first pacing stimulus at the fastest activating region simultaneously with the defibrillation stimulus; and

means for applying at least one second pacing stimulus to the fibrillating heart at a location spaced-apart from the fastest activating region.

52. A system according to Claim 51 wherein the at least one second pacing stimulus is applied using at least one line electrode.

53. A system according to Claim 37 wherein the region comprises the septum.

54. A system according to Claim 37 wherein a location of the fastest activating region is determined by:

determining a Monophasic activation potential (MAP) reading associated with the fibrillating heart.

55. A system for reducing an occurrence of fibrillation of a heart, comprising:

means for detecting a premature contraction of the heart for a plurality of heart beats characterized by nonsustained tachycardia; and

means for applying an electrical stimulus to a region of the heart not in fibrillation likely to contain a fastest activating region.

56. A system according to Claim 55 further comprising:

means for inducing fibrillation of the heart; and

means for determining at least one of a monophasic activation potential (MAP) reading associated with the fibrillating heart, a refractory period associated with the heart using premature stimulation, and a power spectrum analysis to provide a spectrum with a peak power at a highest frequency.

57. A system according to Claim 55 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

58. A system according to Claim 55 wherein a first wavefront propagates along a closed pathway on the heart, wherein the first wavefront generates at least a second wavefront that propagates on the heart outside the fastest activating region.

59. A system according to Claim 55 wherein the reentrant region comprises a closed pathway on the heart.

60. A system according to Claim 59 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

61. A system according to Claim 60 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

62. A system for reducing an occurrence of fibrillation of a heart, comprising:

means for applying, during fibrillation during heart activity characterized by at least one of normal heartbeat activity, premature heartbeat activity, or nonsustained tachycardia activity, an electrical stimulus to a region of a heart that is likely to contain a fastest activating region of the heart.

63. A system according to Claim 62 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

64. A system according to Claim 63 wherein a first wavefront propagates along a closed pathway on the fibrillating heart, wherein the first wavefront generates at least a second wavefront that propagates on the heart outside the fastest activating region.

65. A system according to Claim 62 wherein the reentrant region comprises a closed pathway on the heart.

66. A system according to Claim 65 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

67. A system according to Claim 66 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

68. A system according to Claim 62 further comprising:

means for determining a refractory period associated with the heart using premature stimulation.

69. A system according to Claim 62 further comprising:

means for determining an activation recovery interval measurement associated with the heart.

70. A system according to Claim 62 further comprising:

determining a Monophasic activation potential (MAP) reading of the heart.

71. A system according to Claim 62 further comprising:

means for inducing fibrillation of the heart; and

means for determining a refractory period associated with the heart using premature stimulation.

72. A system according to Claim 62 further comprising:

means for inducing fibrillation of the heart; and

means for determining at least one of a monophasic activation potential (MAP) reading associated with the fibrillating heart, a refractory period associated with the heart using premature stimulation, and a power spectrum analysis to provide a spectrum with a peak power at a highest frequency.

73. A computer program product for defibrillating a heart in fibrillation, comprising:

a computer readable medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code configured to detect fibrillation of the heart; and

computer readable program code configured to apply a defibrillation stimulus to a fastest activating region of the fibrillating heart.

74. A computer program product according to Claim 73 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

75. A computer program product according to Claim 73 wherein a first wavefront propagates along a closed pathway on the fibrillating heart, wherein the first wavefront generates at least a second wavefront that propagates on the fibrillating heart outside the fastest activating region.

76. A computer program product according to Claim 73 wherein the fastest region comprises a closed pathway on the fibrillating heart.

77. A computer program product according to Claim 76 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

78. A computer program product according to Claim 77 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

79. A computer program product according to Claim 73:

wherein the fibrillation comprises atrial fibrillation; and

wherein the fastest activating region comprises at least one of adjacent to pulmonary veins of the fibrillating heart and between the pulmonary veins and a left atrial appendage of the fibrillating heart.

80. A computer program product according to Claim 73:

wherein the fibrillation comprises ventricular fibrillation; and

wherein the fastest activating region comprises a base of a left ventricle of the fibrillating heart.

81. A computer program product according to Claim 73:

wherein the fibrillation comprises ventricular fibrillation; and

wherein the fastest activating region comprises a septum of the fibrillating heart.

82. A computer program product according to Claim 73 wherein the computer readable program code configured to apply comprises computer readable program code configured to apply a first defibrillation stimulus at least one of before, during, or after a second defibrillation stimulus that is greater than the first defibrillation stimulus.

83. A computer program product according to Claim 82 wherein at least one of the first and second defibrillation stimuli is applied using at least a pair of electrodes, wherein the pair of electrodes is located one of:

inside the fastest activating region;

outside the fastest activating region; and

a first electrode of the pair of electrodes is inside the fastest activating region and a second electrode of the pair of electrodes is outside the fastest activating region.

84. A method according to Claim 73 wherein the defibrillation stimulus is applied using a pair of electrodes, wherein the pair of electrodes is located one of:

inside the fastest activating region;

outside the fastest activating region; and

a first electrode of the pair of electrodes is inside the fastest activating region and a second electrode of the pair of electrodes is outside the fastest activating region.

85. A computer program product according to Claim 73 further comprising:

computer readable program code configured to apply at least one pacing stimulus to the fastest activating region simultaneously with the defibrillation stimulus.

86. A computer program product according to Claim 73 further comprising:

computer readable program code configured to apply at least one pacing stimulus to the fastest activating region immediately before or after the defibrillation stimulus.

87. A computer program product according to Claim 73 further comprising:

computer readable program code configured to apply at least one first pacing stimulus at the fastest activating region simultaneously with the defibrillation stimulus; and

computer readable program code configured to apply at least one second pacing stimulus to the fibrillating heart at a location spaced-apart from the fastest activating region.

88. A computer program product according to Claim 87 wherein the at least one second pacing stimulus is applied using at least one line electrode.

89. A computer program product according to Claim 73 wherein the region comprises the septum.

90. A computer program product according to Claim 73 wherein the computer readable program code configured determine the location of the fastest activating region comprises:

computer readable program code configured to determine a Monophasic activation potential (MAP) reading associated with the fibrillating heart.

91. A computer program product for reducing an occurrence of fibrillation of a heart, comprising:

a computer readable medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code configured to detect a premature contraction of the heart for a plurality of heart beats characterized by nonsustained tachycardia; and

computer readable program code configured to apply a defibrillation stimulus to a region of the heart not in fibrillation that is likely to contain a fastest activating region.

92. A computer program product according to Claim 91 further comprising computer readable program code configured to determine the region of the heart likely to contain the fastest activating region including:

computer readable program code configured to induce fibrillation of the heart; and

computer readable program code configured to determine at least one of a monophasic activation potential (MAP) reading associated with the fibrillating heart, a refractory period associated with the heart using premature stimulation, and a power spectrum analysis to provide a spectrum with a peak power at a highest frequency.

93. A computer program product according to Claim 91 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

94. A computer program product according to Claim 91 wherein a first wavefront propagates along a closed pathway on the fibrillating heart, wherein the first wavefront generates at least a second wavefront that propagates on the fibrillating heart outside the fastest activating region.

95. A computer program product according to Claim 91 wherein the reentrant region comprises a closed pathway on the fibrillating heart.

96. A computer program product according to Claim 95 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

97. A computer program product according to Claim 96 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

98. A computer program product for reducing an occurrence of fibrillation of a heart, comprising:

a computer readable medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code configured to apply, during heart activity characterized by at least one of normal heartbeat activity, premature heartbeat activity, or nonsustained tachycardia activity, an electrical stimulus to a region of the heart not in fibrillation that is likely to contain a fastest activating region.

99. A computer program product according to Claim 98 wherein the fastest activating region comprises a reentrant region having a refractory period that is less than areas adjacent to the reentrant region.

100. A computer program product according to Claim 98 wherein a first wavefront propagates along a closed pathway on the fibrillating heart, wherein the first wavefront generates at least a second wavefront that propagates on the fibrillating heart outside the fastest activating region.

101. A computer program product according to Claim 98 wherein the reentrant region comprises a closed pathway on the fibrillating heart.

102. A computer program product according to Claim 101 wherein a wavefront propagates along the closed pathway from a starting point on the closed pathway to an ending point on the closed pathway.

103. A computer program product according to Claim 102 wherein the starting point and the ending point are adjacent to one another on the closed pathway.

104. A computer program product according to Claim 98 further comprising computer readable program code configured to determine the region of the heart likely to contain the fastest activating region including:

computer readable program code configured to determine a refractory period associated with the fibrillating heart using premature stimulation.

105. A computer program product according to Claim 98 further comprising computer readable program code configured to determine the region of the heart likely to contain the fastest activating region including:

computer readable program code configured to determine an activation recovery interval measurement associated with the fibrillating heart.

106. A computer program product according to Claim 98 further comprising computer readable program code configured to determine the region of the heart likely to contain the fastest activating region including:

computer readable program code configured to determining a Monophasic activation potential (MAP) reading associated with the fibrillating heart.

107. A computer program product according to Claim 98 further comprising computer readable program code configured to determine the region of the heart likely to contain the fastest activating region including:

computer readable program code configured to induce fibrillation of the heart; and

computer readable program code configured to determine at least one of a monophasic activation potential (MAP) reading associated with the fibrillating heart, a refractory period associated with the heart using premature stimulation, and a power spectrum analysis to provide a spectrum with a peak power at a highest frequency.